THE anniversary meeting of the Royal Geographical Society was held on Monday in the hall of the University of London, General R. Strachey presiding. The report, which was read by Mr. Clements R. Markham, having been adopted, General Strachey was for the third consecutive year elected President of the Society. The Founder's Medal for the encouragement of geographical science and discovery was presented to Mr. Clements R. Markham, who retires from the honorary secretaryship after twenty-five years' service, in acknowledgment of the valuable services rendered by him to the Society during that period. Lieut. H. Wissmann was awarded the Patron's Medal in recognition of his great achievements as an explorer in Central Africa; Mr. J. M'Carthy, Superintendent of Surveys in Siam, the Murchison Grant; Major Festing, the Cuthbert Peek Grant, for his services as a cartographer on the Gambia River and the country in the neighbourhood of Sierra Leone. The Gill Memorial for 1888 was secured by Mr. Charles M. Doughty. Various scholarships and prizes to students in training colleges were also distributed. The President then delivered his annual address, passing in review the chief geographical events of the year.

THE LINNEAN SOCIETY.

THE hundredth anniversary meeting of this Society was held on Thursday last, 24th inst., at Burlington House, in the library, the usual meeting-room being inadequate for the reception of the large number of members present on this occasion. The President, Mr. Wm. Carruthers, F.R.S., took the chair at three o'clock, and was supported by the two former Presidents who are happily still with us—Prof. Allman and Sir John Lubbock—the Council of the Society, and many distinguished Fellows, amongst whom we noted Sir Richard Owen, Sir Joseph Hooker, Dr. Günther, Sir Walter Buller, Prof. Duncan, Mr. Romanes, Colonel Grant, and amongst the visitors Dr. Henry Woodward, F.R.S., and Mr. Studley Martin, a nephew of the founder.

After preliminary business, H.M. the King of Sweden was elected an honorary member. The Treasurer, Mr. Frank Crisp, laid the last year's accounts before the meeting, and briefly referred to the financial history of the Society during the century now closed. The senior Secretary, Mr. B. Daydon Jackson, presented an account of the Linnean collections from their formation, their purchase by the founder of the Society, and their possession by the Linnean Society. This was succeeded by the President's annual address, which was largely devoted to a review of the Society's past career. He spoke of the original quarto Transactions, then of the octavo Proceedings, finally of the Journal, of which forty-three volumes are extant. During the past year seven parts of the Transactions and twenty of the Journal had been issued, an amount equal to that published during fifteen years in the early part of the century.

A novel feature was then introduced, one of those intended to mark the centenary of the Society. Prof. Thöre Fries, the present occupant of Linnæus's Botanical Chair at Upsala, had been invited to pronounce a eulogium on his illustrious predecessor. As he was detained by his professorial duties in his University, his essay was read by the President. In it he spoke of the profound sleep of natural science during the Middle Ages, and the hard struggle which had to be fought before men of science could liberate themselves from a narrow orthodoxy, or the fetters they had themselves forged by attaching infallibility to Aristotle and classic authors. Linnæus bore an honourable part in placing the study of natural science on a logical basis by his clear definitions, and admirable nomenclature, and by the enthusiasm he was able to rouse in his disciples for the same methods. England, unluckily for Sweden, became his heir; many consequently are the ties which unite the memory of Linnæus with this country, the strongest perhaps being the Linnean spirit, the genuine spirit of freshness and enterprise in which scientific research is carried on in England.

Sir Joseph Hooker then pronounced a eulogy on Robert Brown, the greatest botanist of the present century. He specially dwelt on the evidence afforded by the "Prodromus" of his untiring industry, accuracy of observation and exposition, together with sagacity, caution, and soundness of judgment, in which he has not been surpassed. Where others have advanced beyond the goal he reached, it has been by working on the foundations he laid, aided by modern appliances of optics and physics. His memory was wonderful, he seemed never to forget a plant he had examined; and the same with his books—he could turn to descriptions for a statement or a figure without needing a reference. The noble title conferred upon him by Humboldt has been confirmed by acclamation by botanists of every country, "Botanicorum facile princeps."

Prof. Flower, C.B., F.R.S., delivered an address on Charles Darwin, who, he said, had special claims on their consideration, inasmuch as a large and very important portion of his work was communicated to the world by papers read before the Society and published in the Journal. His life was one long battle against our ignorance of the mysteries of living Nature, and he sought to penetrate the shroud which conceals the causes of all the variety and wonders round us. His main victory was the destruction of the conception of species as being fixed and unchangeable beyond certain narrow limits, a view which prevailed universally before his time. That other factors had operated besides natural selection in bringing about the present condition of the organic world was admitted even by Darwin himself. His work, and the discussions which had sprung from it, had marvellously stimulated research, and he had shown by his life and labours the true methods by which alone the secrets of Nature may be won.

Prof. W. T. Thiselton Dyer spoke on George Bentham, who presided over the Society from 1863 to 1874. A nephew of Jeremy Bentham, and trained to some extent under him, he was early imbued with a taste for method and analysis, and through his mother's fondness for plants he was led to study them, with marvellous results. The records of his life-work are astonishing. Whilst President he delivered a series of masterly addresses, and the latter part of his career witnessed the preparation of the "Flora Australiensis" and a full share of the "Genera Plantarum." He stood in the footsteps of Linnæus, and although the descent was oblique he inherited the mantle of the master whose memory was that day commemorated.

The President stated that the Council had decided to establish a Linnean Gold Medal, to be presented to a botanist and a zoologist in alternate years, but on this occasion it would be awarded in duplicate. The medal bore on the obverse a profile of Linnæus, modelled from the bust in the library; on the reverse, the arms of the Society and the name of the recipient. The President made the first presentation to Sir Richard Owen, recounting the chief services he had rendered to zoology. Sir Richard, with some emotion, expressed his high sense of the honour conferred, and thanked the Fellows for their cordial reception of him. The President then presented a similar medal to Sir Joseph Hooker, with a like recapitulation of the splendid services he had bestowed on botany. Sir Joseph suitably replied, returning his cordial thanks for the distinction.

The remaining formal business included the announcement of the newly-elected Councillors, and the re-election of the officers—Mr. Wm. Carruthers, President; Mr. Frank Crisp, Treasurer; and Messrs. B. Daydon Jackson, and W. Percy Sladen, Secretaries.

The annual dinner was held at the Hotel Victoria, Northumberland Avenue, at seven o'clock. The President took the chair, about sixty of the Fellows being present. In addition to the usual toasts, that of "The Medallists" was given, and replied to by Sir Joseph Hooker, who alluded to the fact that he had personally known eight of the Presidents of the Society, and that the founder himself induced his father, Sir William Hooker, to take up the study of botany. As a proof of his close connection with the Linnean Society, he added that his father, grandfather, father-in-law, and uncle had all been Fellows.

The final portion of the centenary celebration took place the following evening, when the President and officers held a reception at Burlington House. A special feature was made of the Linnean manuscripts and memorials, which were displayed in glass cases with descriptions, a catalogue of them being also distributed. Memorials of other distinguished naturalists were also shown, conspicuously those of Robert Brown and George Bentham, lent by Sir Joseph Hooker and M. Alphonse de Candolle, of Geneva, a foreign member of the Society.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

CAMBRIDGE.—The Rede Lecture on June 8, by Sir F. A. Abel, will be upon applications of science to the protection of human life. It will be illustrated by experiments and the exhibition of appliances.

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Mr. Percy Groom, B.A., late of Trinity College, has been elected to the Frank Smart Studentship in Botany at Gonville and Caius College.

The fittings of the new Chemical Laboratory are costing £1000 more than was originally estimated (from rough drawings only) by Mr. Lyon, Superintendent of the University workshops. Some of this is due to the fact that the fixing of the tables on a bottom independent of the floors of the rooms, and making the cupboard doors fairly dust-proof, originally recommended, was not adopted till after the tables had been fixed, and much cutting of the floors had to be done. Also much of the iron and steel work was not particularized at first.

The Council are taking steps to carry out the appropriation of the old Chemical Laboratory to the department of pathology.

Prof. Darwin will lecture during the long vacation on the theory of the potential, and on attractions, commencing on Tuesday, July 10. The lectures will treat principally of gravitational problems, including attraction of ellipsoids, Gauss's paper, heat of tin, Jacobi's and Dedekind's ellipsoids, oscillations of a fluid sphere, the foundation of the theory of tides, atmospheres of planets, &c.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, May 3.—"Effect of Chlorine on the Electromotive Force of a Voltaic Couple." By Dr. G. Gore, F.R.S.

If the electromotive force of a small voltaic couple of unamalgamated magnesium and platinum in distilled water, is balanced through the coil of a moderately sensitive galvanometer of about 100 ohms resistance, by means of that of a small Daniell's cell, plus that of a sufficient number of couples of iron and German silver of a suitable thermo-electric pile (see Proc. Birm. Philos. Soc., vol. iv. p. 130), the degree of potential being noted; and sufficiently minute quantities of very dilute chlorine water are then added in succession to the distilled water, the degree of electromotive force of the couple is not affected until a certain definite proportion of chlorine has been added; the potential then suddenly commences to increase, and continues to do so with each further addition within a certain limit. Instead of making the experiment by adding chlorine water, it may be made by gradually diluting a very weak aqueous solution of chlorine.

The minimum proportion of chlorine necessary to cause this sudden change of electromotive force is extremely small; in my experiments it has been 1 part in 17,000 million parts of water,[1] or less than 1/7000 part of that required to yield a barely perceptible opacity in ten times the bulk of a solution of sal-ammoniac by means of nitrate of silver. The quantity of liquid required for acting upon the couple is small, and it would be easy to detect the effect of the above proportion, or of less than one ten-thousand-millionth part of a grain of chlorine, in one-tenth of a cubic centimetre of distilled water by this process. The same kind of action occurs with other electrolytes, but requires larger proportions of dissolved substance.

As the degree of sensitiveness of the method appears extreme, I add the following remarks. The original solution of washed chlorine in distilled water was prepared in a dark place by the usual method from hydrochloric acid and manganic oxide, and was kept in an opaque well-stoppered bottle in the dark. The strength of this liquid was found by means of volumetric analysis with a standard solution of argentic nitrate in the usual manner, the accuracy of the silver solution being proved by means of a known weight of pure chloride of sodium. The chlorine liquid contained 2·3 milligrammes or 0·03565 grain of chlorine per cubic centimetre, and was just about three-fourths saturated.

One-tenth of a cubic centimetre of this solution ("No. 1"), or 0·003565 grain of chlorine, was added to 9·9 c.c. of distilled water and mixed. One cubic centimetre of this second liquid ("No. 2"), or 0·0003565 grain of chlorine was added to 99 c.c. of water and mixed; the resulting liquid ("No. 3") contained 0·000003565 grain of chlorine per cubic centimetre. To make the solutions ("No. 4") for exciting the voltaic couple, successive portions of $\frac{1}{10}$ or $\frac{1}{20}$ c.c. of ("No. 3") liquid were added to 900 cubic centimetres of distilled water and mixed.

I have employed the foregoing method for examining the states and degrees of combination of dissolved substances in electrolytes, and am also investigating its various relations.

May 17.—"Magnetic Qualities of Nickel." By J. A. Ewing, F.R.S., Professor of Engineering, University College, Dundee, and G. C. Cowan.

The experiments described in the paper were made with the view of extending to nickel the same lines of inquiry as had been pursued by one of the authors in regard to iron (Phil. Trans., 1885, p. 523). Cyclic processes of magnetization have been studied, in which a magnetizing force of about 100 C.G.S. units was applied, removed, reversed, again removed, and re-applied, for the purpose of determining the form of the magnetization curve, the magnetic susceptibility, the ratio of residual to induced magnetism, and the energy dissipated in consequence of hysteresis in the relation of magnetic induction to magnetizing force. Curves are given, to show the character of such cycles for nickel wire in three conditions: the original hard-drawn state, annealed, and hardened by stretching after being annealed. The effects of stress have also been examined (1) by loading and unloading magnetized nickel wire with weights which produced cyclic variations of longitudinal pull, and (2) by magnetizing while the wire was subjected to a steady pull of greater or less amount. The results confirm and extend Sir William Thomson's observation that longitudinal pull diminishes magnetism in nickel. This diminution is surprisingly great: it occurs with respect to the induced magnetism under both large and small magnetic forces, and also with respect to residual magnetism. The effects of stress are much less complex than in iron, and cyclic variations of stress are attended by much less hysteresis. Curves are given to show the induced and residual magnetism produced by various magnetic forces when the metal was maintained in one or other of certain assigned states of stress; also the variations of induced and residual magnetism which were caused by loading and unloading without alteration of the magnetic field. Values of the initial magnetic susceptibility, for very feeble magnetizing forces, are stated, and are compared with the values determined by Lord Rayleigh for iron, and the relation of the initial susceptibility to the stress present is investigated. The paper consists mainly of diagrams in which the results are graphically exhibited by means of curves.

Chemical Society, May 3.—Mr. W. Crookes, F.R.S., in the chair.—The following papers were read:—The determination of the molecular weights of the carbo-hydrates, by Mr. H. T. Brown and Dr. G. H. Morris. The law established by Blagden in 1788, that the lowering of the freezing-point of aqueous solutions of inorganic salts is proportional to the weight of substance dissolved in a constant weight of water, was extended by de Coppet in 1871–72, who pointed out that when the lowering of the freezing-point is calculated for a given weight of the substance in 100 grammes of water, the result, which he termed the coefficient of depression, is constant for the same substance, and that the coefficients for different substances bear a simple relation to their molecular weights. Raoult extended the law to organic substances and to other solvents than water, and showed that when certain quantities of the same substance are successively dissolved in a solvent upon which it has no chemical action, there is a progressive lowering of the point of congelation of the solution, and that this lowering is proportional to the weight of the substance dissolved in a constant weight of water. The "coefficient of depression," A—that is, the depression of the point of congelation produced by 1 gramme of the substance in 100 grammes of the solvent—is given by the formula $\frac{C \times y}{x \times 100} = A$, where C is the observed depression produced by x grammes of the substance dissolved in y grammes of the solvent, and from this value the "molecular depression," T, is calculated by the formula $M \times A = T$, where M is the molecular weight of the substance in question. T is a value varying with the nature of the solvent, but remaining constant with the same solvent for numerous groups of compounds, whence it follows that A and T being known, the molecular weight of the substance in question may be determined from the equation $M = T/A$. This method of Raoult's, which is of value in cases where a vapour density determination is not possible, has been employed by the authors to determine the molecular weights of the following carbo-hydrates: dextrose, cane-sugar, maltose, milk-sugar, arabinose, and raffinose, and also that of mannitol (the solvent being water), with results which lead to formulæ

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[1] As 1 part of chlorine in 17612 million parts of water had no visible effect, and 1 in 17000 millions had a distinct effect, the influence of the difference, or of 1 part in 500,000 millions, has been detected.

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